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(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Use of Benzaldehydes to Mark Hydrocarbons

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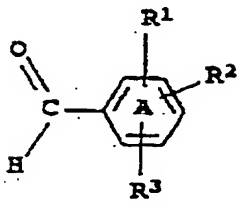
(57) 5 Claims

We claim:

1. The use of benzaldehydes of the formula I



(I)

in which

the ring A may be benzofused, and

R^1, R^2 and R^3 are each, independently of one another, hydrogen, hydroxyl, C_1–C_{15}-alkyl, C_1–C_{15}-alkoxy, cyano, nitro or a radical of the formula NR^4R^5 or $COOR^6$ where

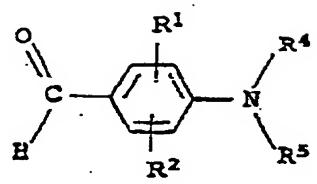
R^4 is hydrogen or C_1–C_{15}-alkyl with or without interruption by from 1 to 4 oxygen atoms in ether function and with or without substitution by phenyl,

R^5 is C_1–C_{15}-alkyl with or without interruption by from 1 to 4 oxygen atoms in ether function and with or without substitution by phenyl, or is a radical of the formula L–NX^1X^2 where L is C_2–C_8-alkylene and X^1 and X^2 are singly, independently of each other, C_1–C_6-alkyl or together, together with the nitrogen atom joining them together, a 5- or 6-membered saturated heterocyclic radical with or without an oxygen atom in the ring, and

R^6 is hydrogen, C_1–C_{15}-alkyl with or without interruption by from 1 to 4 oxygen atoms in ether function or a radical of the formula L–NX^1X^2 where L, X^1 and X^2 are each as defined above,

as markers for hydrocarbons.

2. A use as claimed in claim 1 wherefor the benzaldehydes conform to the formula Ia

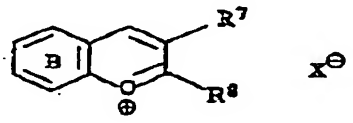


(Ia)

where R^1, R^2, R^4 and R^5 are each as defined in claim 1.

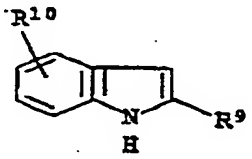
3. A use as claimed in claim 1 or 2 wherefor R^1 and R^2 are independently of each other hydrogen, hydroxyl, C_1-C_{15}-alkyl, C_1-C_{15}-alkoxy or a radical of the formula $COOR^6$ where R^6 is as defined in claim 1, R^4 is hydrogen or C_1-C_{15}-alkyl and R^5 is C_1-C_{15}-alkyl.

4. A method of detecting benzaldehydes of formula I as set forth in claim 1 in hydrocarbons, which comprises treating the hydrocarbon with an aqueous-alcoholic or alcoholic medium comprising a protic acid, at least one compound from the group of compounds consisting of substituted pyrylium salts of the formula II



(II),

where R^7 is C_1-C_8-alkyl, phenyl, C_1-C_5-alkoxy or halogen and R^8 is methyl or R^7 and R^8 together are 1,4-butylene and the ring B may be fused with a benzene ring and may be substituted by C_1-C_4-alkyl, pyrrolidino, piperidino, morpholino, chlorine or bromine or in ring position 7 optionally also by hydroxyl, C_1-C_4-alkoxy, mono- or di(C_1-C_5-alkyl)amino which may in turn be substituted by chlorine or phenyl, and $X^\ominus$ is an optional anion, and indoles of the formula III



(III),

where R^9 and R^{10} are independently of each other hydrogen, hydroxyl, a radical of the formula NR^4R^5, where R^4 and R^5 are each as defined in claim 1, C_1-C_8-alkyl, phenyl, C_1-C_5-alkoxy or halogen,

and optionally a halide of the metals zinc, aluminum or tin.

5. A hydrocarbon with a marker comprising one or more benzaldehydes of the formula I as set forth in claim 1.

ABSTRACT 2195019

The invention relates to the use of benzaldehydes of the formula (I), in which ring A can be benzo-anellated and R^1, R^2 and R^3 are hydrogen, hydroxy, C_1-C_{15} alkyl, C_1-C_{15} alkoxy, cyano, nitro or a radical of the formula NR^4R^5 or $COOR^6$ in which R^4 is hydrogen or possibly substituted C_1-C_{15} alkyl, R^5 is possibly substituted C_1-C_{15} alkyl or a radical of the formula L-NX^1X^2, in which L is C_2-C_8 alkylene and X^1 and X^2 are mutually independently C_1-C_6 alkyl or, together with the nitrogen atom bonding them, a heterocyclic radical, and R^6 is hydrogen, possibly substituted C_1-C_{15} alkyl or a radical of the formula L-NX^1X^2, in which L, X^1 and X^2 have the above meanings, as marking agents for hydrocarbons, a process for detecting these benzaldehydes in hydrocarbons and hydrocarbons containing the above benzaldehydes.